

A Preliminary Assessment of Urban Fruit Tree Projects in the United States

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Abstract

Fruit trees are a discrete, though often small, subset of urban trees. While they are rarely discussed independently of the other trees in an urban forest, fruit trees possess unique benefits and maintenance requirements. Moving into an arena often occupied by urban foresters, organizations referred to here as Urban Fruit Tree Projects (UFTPs) are beginning to interact with urban fruit trees through identification, planting, maintenance, harvesting, and educational programming across the United States. While UFTPs in the United States have gained media attention over the last two years, there is little academic literature that discusses this new trend. In an attempt to begin to build a knowledge base, this research utilized current literature on urban forestry and urban agriculture as well as interview and survey data from active projects in the United States to answer the following questions: (1) How are UFTPs currently planting, maintaining, and harvesting fruit trees in the United States? (2) Do these projects function within a forestry or agricultural framework, or do they utilize a new framework? Survey and interview data was collected from 11 UFTPs in the United States, themes were identified, and a typology was constructed in an attempt to answer these questions. The following primary results were identified: (1) A majority of participants possess agricultural missions, however, (2) participants engage in activities and provide products and services that span both the field of agriculture and forestry, and (3) participants are perfectly situated within the gap between the field of forestry and agriculture, though they rarely bridge the gap deliberately.

Introduction

In an urban setting, trees provide vital economical and environmental benefits that range from noise abatement and energy savings through the shading of buildings, to increases in biodiversity (Nowak et. al. 2010). Trees also provide the benefits of storm water mitigation, improvements in air and soil quality, and increases in the value of surrounding properties as both real estate and community space (Nowak et. al. 2010). Further, the action of planting and managing trees in spaces of significance contributes to a culture of ownership, which in turn, encourages citizens to engage in other forms of community improvement and environmental stewardship. In this regard, trees are an essential component of urban green infrastructure.

Fruit trees are a discrete, though often small, subset of urban trees. While they are rarely discussed independently of the other trees in an urban forest, fruit trees possess unique benefits and maintenance requirements. Fruit trees possess the same economic and ecological benefits as other urban trees but also possess the added benefit of food production aiding in the food security of an urban area. Fruit trees also have unique maintenance requirements including pollination requirements and pest management to maximize productivity and produce management to minimize damage and risk created by excess fruit. Fruit trees are also often subject to different public perceptions than their non-fruiting counterparts, which results in a unique fruit tree culture that is often regionally specific.

Recently, non-profits and municipalities around the United States have begun to discuss the potential of urban fruit trees in the context of urban agriculture (Lieberworth 2012). Moving into an arena often occupied by urban foresters, organizations referred to here as Urban Fruit Tree Projects (UFTPs) are beginning to interact with urban fruit trees through identification, planting, maintenance, harvesting, and/or educational programming across the country.

While UFTPs in the United States have gained media attention over the last two years, there is little academic literature that discusses this new trend. In an attempt to begin to build a knowledge base about the theoretical and practical implications of these projects, this research utilized current literature on urban forestry and urban agriculture as

well as interview and survey data from active projects in the United States to answer the following questions:

- (1) How are UFTPs currently planting, maintaining, and harvesting fruit trees in the United States?
- (2) Do these projects function within a forestry or agricultural framework, or do they utilize a new framework?

Background

Urban Forestry

The relatively new but well-developed field of urban forestry focuses on the creation and continuance of the urban forest, which includes, by definition, all components of urban green infrastructure (Schwab 2009). In most cases, urban forests in the United States were originally pieced together by independent land use choices made by public and private landowners alike (McLain et al 2012). Urban foresters, then, work to create and maintain a more robust urban forest ecosystem in an attempt to maximize the ecosystem and societal benefits trees are capable of providing.

Academic literature on the field of urban forestry reveals that most consider urban forests as service providers, as opposed to goods producers, often seen as the role of rural forests and forests outside the United States (Clark 1997, Schwab 2009). International research on the value of forests reveal that forests play an important role in increasing community food security, helping households bridge gaps in food accessibility (Sutherland 2011, Arnold et al 2011). However, other scholars argue that even those that live in urban areas within the United States depend on products produced by urban trees. Foresters that overlook this use of urban trees reveal the tendency of urban foresters against blending rural forest benefits with their urban counterparts. (Frank 2011, McLain et al 2012)

While there is overwhelming consensus that urban forests provide services in the form of soil, water, and air improvements and physical and psychological well being, many urban forest practitioners have been hesitant to embrace the additional benefit of food production (Clark 1997, Schwab 2009). Fruit produced by urban trees, especially when untended, can cause a myriad of problems ranging from a messy nuisance to personal

injuries causing urban foresters to keep their distance (Bartlett 2012). Recent media reports on an increasing public interest in fruit trees have revealed an expected sentiment. Earlier this year, the head of the Urban Horticulture Institute at Cornell University argued,

“Harvesting and distributing fruit and keeping away vermin go beyond what urban forestry workers ought to manage on top of their other work and budget constraints ... food production is not and should not be within the scope of service that municipal foresters are responsible for.”¹

Urban Agriculture

Evolving along side the field of urban forestry, the field of urban agriculture has gained momentum in cities across the United States over that last two decades. Created to revitalize urban areas economically and environmentally, urban agriculture involves growing, harvesting, and distributing food through cultivation and husbandry (Quon 1999, Bailkey et al 2000, Goldstein et al 2011).

While classical definitions of urban agriculture refer to trees collectively as non-food components (Pothukuchi and Kaufman 2000, Bailkey et al 2000), recent research has shown that trees have become a growing component of the field. Still, trees are seen as being largely under the domain of urban foresters. (McClintock and Cooper 2009, Frank 2011). Fruit trees, specifically, have yet to be the focus of urban agriculture research.

Bridging the Gap

While the coexistence of agriculture and forestry has been explored and promoted as the field of agroforestry in rural areas for decades (Nair 1993), urban areas in the United States have yet to adopt formal strategies for bridging the gap between food production and tree management through programs or policies, leaving fruit trees in limbo. A single study has hypothesized that fruit tree projects may be able to bridge the gap between urban food production and forestry, forming a theoretical and practical place for fruit trees (McLaine et al 2012).

¹ <http://www.theatlanticcities.com/arts-and-lifestyle/2012/02/should-public-trees-bear-fruit/1175/>

Methodology

In an attempt to build on this hypothesis, this research attempted to determine if and how Urban Fruit Tree Projects are bridging the gap across the United States. This research began with a comprehensive review of peer-reviewed literature on urban forestry and urban agriculture as well as public project reports on public tree plantings, urban orchards, and public fruit harvests.

An exploratory, mixed method approach was then used to evaluate stakeholders. First, a systematic Internet search was used to develop a preliminary list of Urban Fruit Tree Projects in existence in the United States. The search phrases “urban fruit tree projects” and “urban public orchards” were utilized and the top 20 search results for each phrase were examined. Projects were excluded from this research if they solely engaged in the mapping of existing urban trees, a fruit bartering system, or artistic activities, were not currently active, not located United States, or gleaned or grafted without permission. This search identified 15 UFTPs.

In an effort to include established urban tree planting organizations that have begun to work with fruit trees but don’t market themselves solely as fruit tree projects, a separate search using the phrase “urban tree planting projects” was conducted. The top 20 results for this phrase were examined and 15 projects were selected bringing the total number of projects to 30.

Seven projects were selected based on their collective geographic distribution and contacted to participate in a semi-structured telephone interview, of which four projects chose to participate. The telephone interviews consisted of 13 primary and 13 secondary questions geared toward acquiring a broad range of qualitative information about how UFTPs function. Each interviewee was also asked to identify any other fruit tree projects of which they were aware for participation in this research. Through this snowball recruitment method, four additional projects were identified.

The 30 projects that had yet to participate in the research were sent a 20 question electronic survey. The questions in the survey were designed using the information obtained from the four preliminary interviews and geared toward acquiring both qualitative and quantitative information about each project’s inputs, execution, and

outputs. In total, seven UFTPs completed the survey, bringing the total number of participants to 11 and the overall rate of return to 32% (11/34).

Upon completion of both the interview and survey phases of the research, qualitative and quantitative analysis was completed. The qualitative analysis consisted of theme identification using the information collected through the interviews and surveys. Additionally, comparisons were made between the identified themes and traditional urban forestry and urban agriculture programs.

The quantitative analysis consisted of the formation of a typology structure using coded information collected through the interviews and surveys. Responses to specific questions regarding the mission, activities, personnel, stakeholders, and products and services of each UFTP were coded based on the inclusion or exclusion of agriculture and forestry terminology. A typology structure was then built to illustrate the most frequent model utilized by the participating UFTPs.

Results

Several trends emerged from the survey and interview data collected from the 11 Urban Fruit Tree Projects. Themes surrounding the subjects of organizational age, time consuming activities, tree planting location and orientation, fruit harvest and distribution, funding sources, and challenges. A summary of this information can be found in Table 1.

To begin, all participating projects were founded within in the last 6 years with the average organizational age of the participating projects being 3.3 years. Overall, the participating projects spent to the most time on educational programming, fruit harvesting, and tree planting. Several projects also reported that outreach and administration was one of their top time consuming activities. Activities like tree inventorying, identification, and mapping, and volunteer training and activism were delineated as less time consuming.

While a majority of UFTPs actively participate in tree planting, not all projects do. Trends in tree planting appear to be determined by the current state of fruit trees in the region the project serves. In all cases, urban fruit trees were described by projects as either an existing or potential component of urban areas. Projects located in the southern and southwestern United States noted the natural abundance of fruit trees on private land, and as a result concerned themselves with food distribution rather than planting more fruit

trees, despite requests from the public in some cases. Projects located in the Midwest, however, focus on tree planting and increasing the potential for fruit trees and an urban resource.

Of those projects that do plant trees, most have chosen to plant trees in an orchard configuration, revealing a preference for agricultural design. Few projects make an attempt to plant trees in tree lawns, along streets, and within existing urban forest stands, often citing a concern for tree abuse or neglect. These trees, however, are not planted solely on private land. Most projects chose land, not because of its status as public or private, but rather because of the organization or individual who has long-term access to the land. Sites associated with churches, schools, partner non-profits, and supportive citizens are often chosen by projects as tree planting locations.

Once pre-existing or project-planted trees begin to bear fruit, projects must begin to grapple with fruit distribution. Overall, projects distributed the greatest amount of fruit to community agencies, followed by project volunteers. The third greatest quantity of fruit was sold to the public and landowners took the smallest quantity. While most projects used recipient demand to dictate fruit distribution, one project used the quality of fruit as an indication of who should receive it. In this case, the highest quality fruit was donated, middle-quality fruit was given to volunteers, and the lowest quality was composted.

Funding was also discussed with the projects that participated in this research. The majority of projects identified private grants and donations as their primary source of funding. Events and marketing campaigns using urban fruit was also described as an important funding source. Despite these sources, many projects expressed that securing adequate funding was a consistent challenge. One project explained that, because their mission fell within the fields of forestry, agriculture, and social services, grants that require affiliation with a standard and singular category were hard to obtain.

Participating projects also identified public perceptions as a challenge. As one project explained, people's perceptions of fruit trees as difficult to care for and pest-ridden have prevented urbanites from taking a more active role in their project. Despite recent media attention on the potential for controversy when UFTPs clash with non-supportive city ordinances and state laws, no projects identified legislation as a challenge to their project's success.

Beyond public perception, many projects discussed their concern for the long-term sustainability of their project. It is costly to harvest large quantities of fruit without secure, stable revenue streams, bringing into question the ability of UFTPs to transition into permanent pillars of their communities. Several projects emphasized the need for increased and continued collaboration within their communities to sustain the natural and human capital associated with their projects.

Organization	Location	Founding Year	Time Consuming Activity	Tree Planting Locations	Tree Planting Orientation	Fruit Distribution (Owners-Harvesters-Agencies-Sold to Public)	Harvesters	Primary Funding Source	Primary Challenges
Backyard Harvest: Community Orchard Program	Moscow, ID	2006	Fruit Harvesting (75%)	-	-	0%-0%-100%-0%	Staff	Private Grants	Lack of Financial Support
Portland Fruit Tree Project	Portland, OR	2006	Fruit Harvesting (50%)	Public	Orchards	25%-50%-25%-0%	Volunteers	Private Grants	Lack of Financial Support
Pennsylvania Horticultural Society: City Harvest Program	Philadelphia, PA	2006	Educational Programming (40%)	Public/Private	Various	15%-5%-40%-40%	Partner Organizations	Private Grants	Land Access Barriers
Philadelphia Orchard Project	Philadelphia, PA	2007	Tree Planting (40%)	Public/Private	Orchards	-	Partner Organizations	Private Grants	Long-term Sustainability
City Fruit	Seattle, WA	2008	Fruit Harvesting (75%)	Private	Orchards	0%-0%- 85%-15%	Contractors	Public Grants	Long-term Sustainability
Neighborhood Harvest	Ashland, OR	2008	Fruit Harvesting (75%)	-	-	25%-25%-25%-25%	Volunteers	Selling Fruit	Finding Fruit Purchasers
Bloomington Community Orchard	Bloomington, IN	2010	Tree Maintenance (50%)	Public	Orchards	-	Volunteers	Public Grants/ Private Donations	Long-term Sustainability
Baltimore Orchard Project	Baltimore, MD	2011	Administration (50%)	Private	Orchards	9%-12%-89%-0%	Volunteers	In-kind from Volunteers	Lack of Financial Support/ Lack of Expertise
Casey Trees	Washington D.C.	2011	Tree Planting (50%)	Public/Private	Orchards	0%-50%-50%-0%	Partner Organizations	Private Grants	Public Perception/ Participation
New Orleans Fruit Tree Project	New Orleans, LA	2011	Fruit Harvesting (75%)	-	-	0%-0%- 95%-5%	Volunteers	Public Grants	Lack of Financial Support
Trees Forever	Marion, IA	2012	Educational Programming (40%)	Private	Orchards	-	-	Public Grants/ Private Donations	-

Table 1: A summary of the qualitative responses obtained from research participants. Boxes were left empty if no data was available from the project on the corresponding subject.

To further analyze the participating projects and their theoretical position within the fields of agriculture and forestry, five organizational characteristics were selected and a typology was constructed. Each project’s mission, activities, personnel, stakeholders, and products and services were analyzed and coded as agriculture (A), forestry (F), combination (C), or neither (N). A summary of these codes can be found in Table 2.

Organization	Location	Mission	Activities	Staff	Stakeholders	Products/ Services
Backyard Harvest: Community Orchard Program	Moscow, ID	A	A	N	A	A
Portland Fruit Tree Project	Portland, OR	A	C	A	C	C
Pennsylvania Horticultural Society: City Harvest Program	Philadelphia, PA	A	A	A	A	A
Philadelphia Orchard Project	Philadelphia, PA	C	C	A	A	C
City Fruit	Seattle, WA	C	C	C	C	C
Neighborhood Harvest	Ashland, OR	A	A	N	A	A
Bloomington Community Orchard	Bloomington, IN	A	C	C	C	C
Baltimore Orchard Project	Baltimore, MD	C	C	N	F	C
Casey Trees	Washington D.C.	C	C	F	A	C
New Orleans Fruit Tree Project	New Orleans, LA	A	A	N	A	A
Trees Forever	Marion, IA	F	F	F	F	F

Table 2: A summary of coded organizational characteristics for each participating project. A code of “A” denotes Agriculture, while “F” denotes Forestry, “C” denotes combination, and “N” denotes neither.

Projects with agricultural missions focus on the creation of fruit culture and the equitable access to urban fruit, while projects with forestry missions focus on tree culture and the creation of resilient ecosystems. The decidedly “combination” mission of one project mentioned the desire to “provide a sustainable and educational source of food for local communities” as well as the desire to “increase the nation’s tree canopy.” While all types of missions were present, most projects possessed agricultural missions (A, Table 2).

On the other hand, most projects engaged in a combination of agricultural and forestry activities (C, Table 2). Most projects simultaneously participated in tree care and fruit distribution. Perhaps unusually, more project personnel have forestry expertise than agriculture expertise, though most personnel have expertise in neither field.

Stakeholders were often described as compliments to staff, covering areas of less familiarity to project personnel, providing services and expertise the project could not feasibly provide itself. The coding process revealed this as well. While personnel, if affiliated with either, were affiliated with forestry expertise, stakeholders were often of agricultural affiliation (A, Table 2).

Interestingly, a vast majority of projects described their ability to provide both agricultural products like fruit and nutrition and forestry services like green space and tree canopy (C, Table 2).

Using this information, a typology was then constructed (Figure 1). Organizational characteristics were listed vertically as levels, with each potential code listed horizontally at each level. Numerical subscripts were utilized to illustrate the number of projects that received each code at each level and arrows were used demonstrate each unique path through the levels. Two projects, whose paths are marked with bold arrows, illustrate a

unique ability to incorporate both the fields of agriculture and forestry in all levels of the typology.

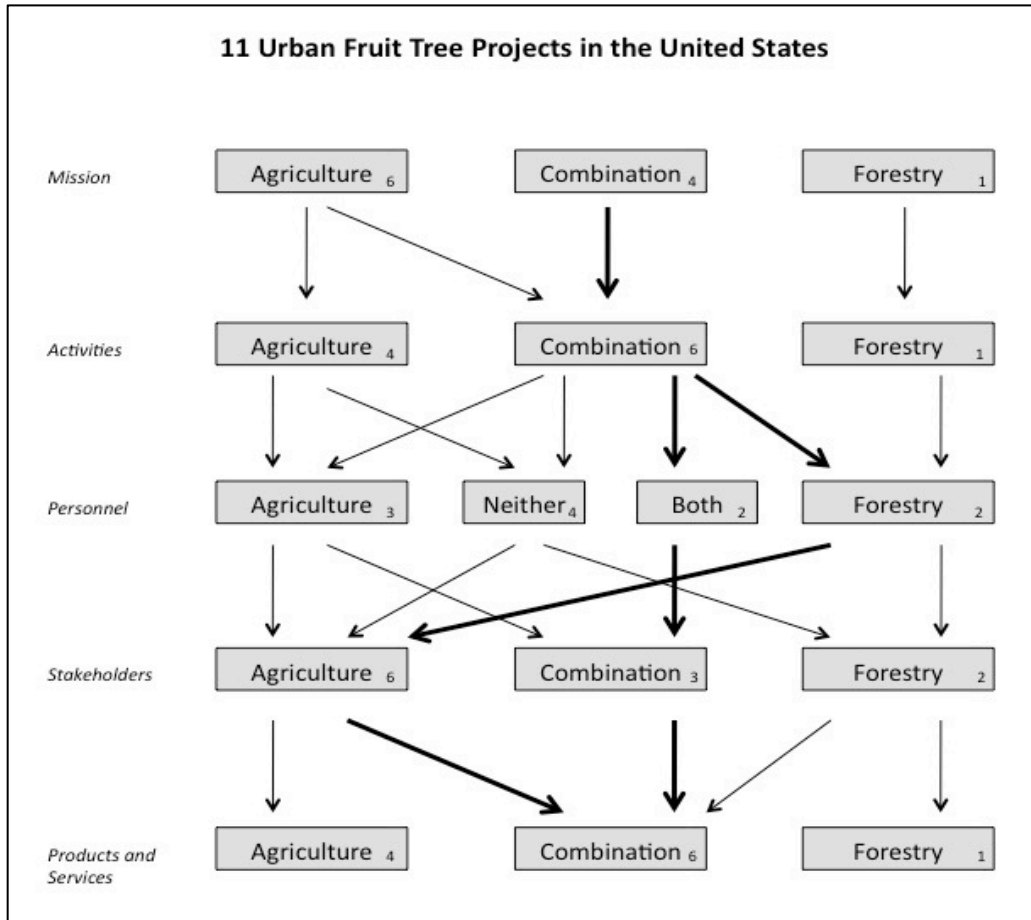


Figure 1: A quantitative typology constructed from the coding results in Table 2. Numerical subscripts illustrate the number of projects that received each code at each level and arrows indicate each unique path through the vertical organizational characteristics. Bold arrows illustrate a path that incorporates both the fields of agriculture and forestry in all levels of the typology.

Together these results provide a large amount of information about how UFTPs in the United States are currently functioning. While no two projects are exactly alike, several trends can be identified.

Discussion

It appears that these projects are perfectly situated within the gap between the fields of forestry and agriculture, though they rarely bridge the gap deliberately. Most

projects describe the object of their attention as fruit with trees attached or trees with fruit attached, rarely are the fruit and the tree described as a single entity.

Figure 2 is an illustration of this ability of UFTP's to bridge the gap between urban forestry projects and urban agriculture projects. All arrows indicate a potential connection, however the solid arrows indicate those connections that were demonstrated by a majority of research participants.

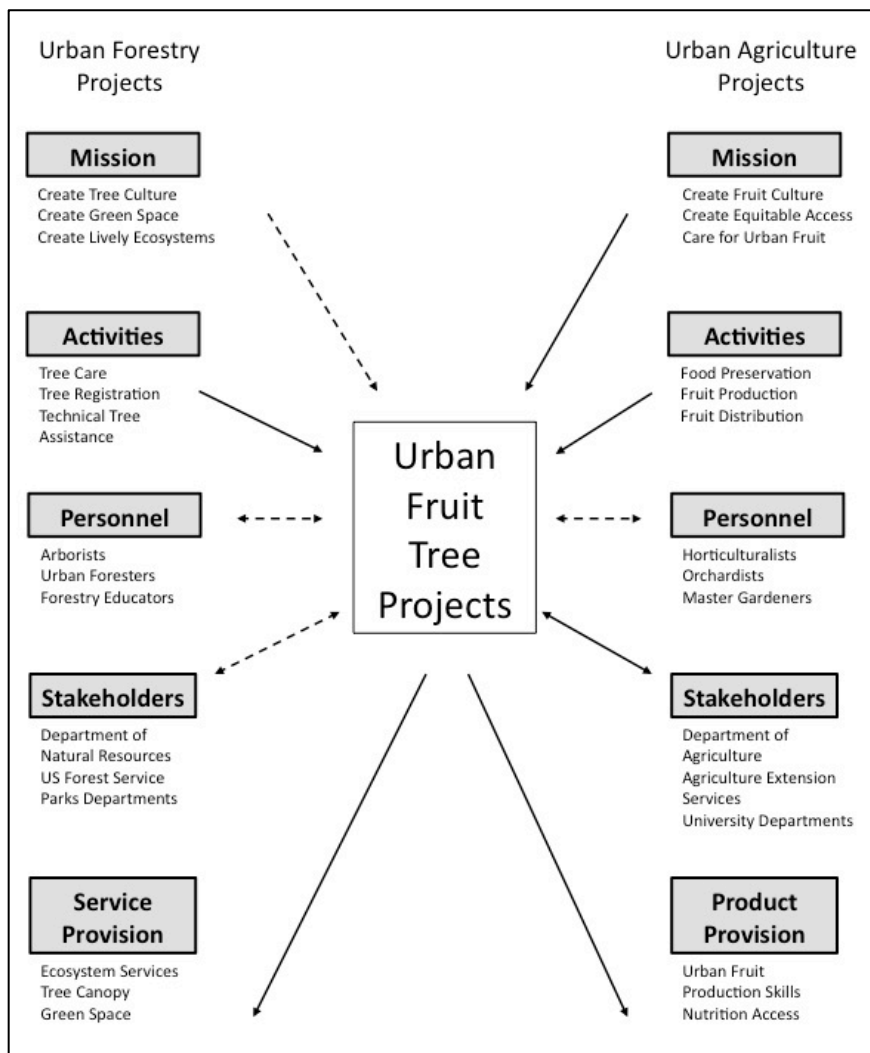


Figure 2: An illustration of the ability of Urban Fruit Tree Projects to bridge the gap between agriculture and forestry projects. Arrows indicate potential connections between the projects, while bold arrows indicate those connections demonstrated by a majority of research participants.

Despite the general tendency for these projects to fully span the gap between agriculture and forestry, older, more developed projects have begun to borrow influence

from the field of urban forestry in several qualitative ways. Mature projects have described their transition from tree planting to tree management, and along with it a transition to forest-level management and ecosystem-scale interests.

As UFTPs begin to borrow influence from the field of forestry, urban forest projects might benefit from reciprocating. It's important to note that while park and street trees have long been under the jurisdiction of urban foresters around the country, up to 90% of urban trees are planted on private land (Clark 1997). Urban fruit tree projects could provide an entry point into private lands and therefore private trees for urban foresters and forest projects alike. And the mutual benefits do not end there.

Just as citywide management plans "add to an urban forest's sustainability by addressing important issues and creating a shared vision for the future of the community's urban forest," (Clark 1997) UFTPs might benefit from making management plans at a similar scale. Similarly, UFTPs are in a unique position to effectively contribute to urban forestry management plans already in existence, bridging the theoretical gap, while increasing their internal sustainability.

As UFTPs move forward, they may want to formulate thoughtful strategies for managing the "common-pool resources" (Fischer and Steed 2008) they are currently creating. While many of these projects have been formed under conditions of excess (fruit is falling off trees and rotting by the tons), moves toward public fruit tree plantings must be quickly followed by strategies for managing the resulting products and services these trees will provide. The Bloomington Community Orchard is the only known project to be publically considering this challenge. A public forum, called "Sharing the Harvest" was hosted by the Orchard on October 20th of this year. (Bloomington Community Orchard 2012)

Conclusions

Through the use of interview and survey data, this research began to build a knowledge base about Urban Fruit Tree Projects in the United States. The research reveals that while many projects possess primarily agricultural missions, they engage in activities and provide products and services that span both the field of agriculture and forestry. This research supports the conclusion that these projects are perfectly situated within the gap

between the field of forestry and agriculture, though they rarely bridge the gap deliberately.

However, this research is but an initial step in an attempt to better understand these projects. As these programs develop, and more projects are established, additional research should be conducted to further examine the models these projects utilized to complete the important task of interacting with urban fruit trees. The questions posed in this research can be utilized to further analyze the theoretical and practical implications of these new, multi-disciplinary projects.

The methods used in this research do not come without limitations. First, because a systematic Internet search was utilized to identify research participants, this research failed to connect with those urban fruit tree projects that do not possess a significant Internet presence. A snowball recruitment method was also utilized in an attempt to identify additional participants, however, this approach was ineffective. Few participants were able to identify other Urban Fruit Tree Projects in the United States. Consequently, this research was only able to draw from a small pool of participants. While a moderate rate of return was achieved, a larger number of participants would strengthen the results of this research.

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Resources

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Appendix A: Survey Questionnaire

Urban Fruit Tree Project Assessment
IRB STUDY #1209009528

Q1 With which project are you affiliated?

Q2 How are you affiliated with the project?

Q3 Please briefly describe the project's history and mission.

Q4 Please list the primary services and/or products the project provides.

Q5 Please use the boxes below to indicate the percentage of time the project spends on each of the following activities.

- Tree Planting
- Tree Maintenance
- Tree Inventory, Identification, Mapping
- Fruit Harvesting
- Fruit Distribution
- Educational Programming
- Volunteer/Employee Training
- Lobbying, Activism
- Other

Q6 Please list any activities that were considered as "other" in the question above.

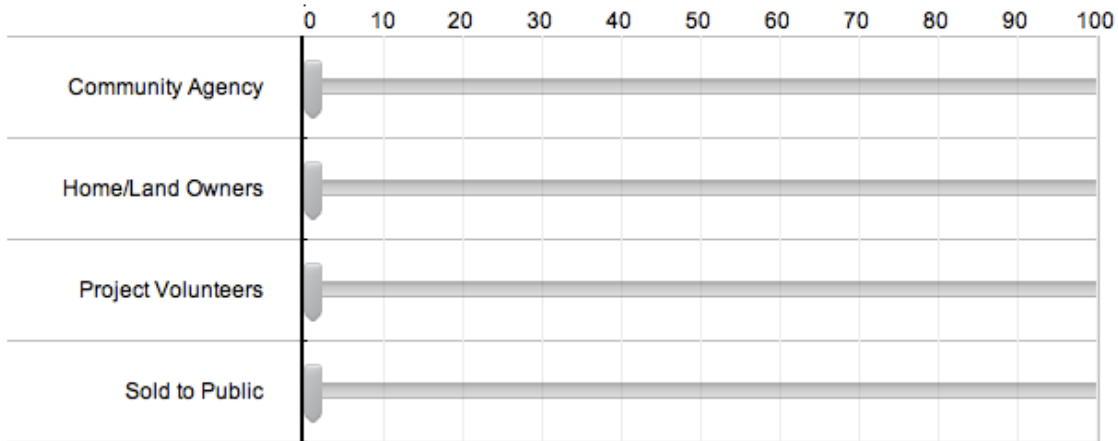
Q7 If applicable, please provide a brief description of the project's tree planting and maintenance procedures.

Your description may include the type of land utilized for plantings (public/private), the orientation in which the trees are often planted (orchard, street trees), and the personnel involved in this aspect of the project.

Q8 If applicable, please provide a brief description of the project's fruit harvesting and distribution procedures.

Your description may include the scale and frequency of harvests, the handling of the fruit, and the personnel involved in this aspect of the project.

Q9 If applicable, please use the scale below to indicate the percentage of the project's harvested fruit that received by each entity.



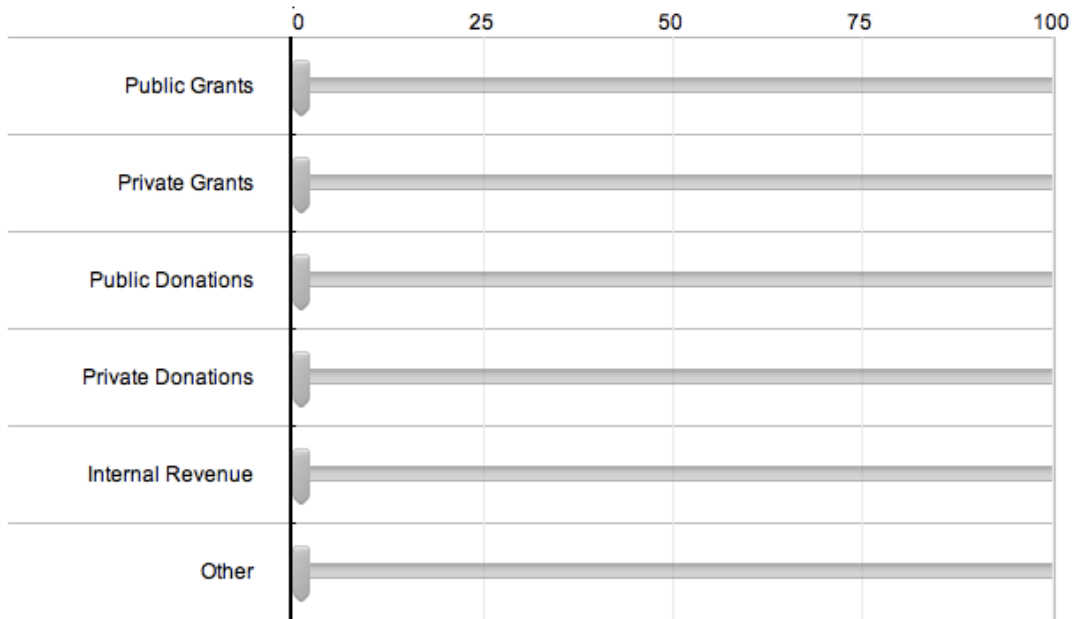
Q10 Please mark the circle that most appropriately indicates your level of interaction with each of the following stakeholder groups.

	No Interaction	Limited Interaction	Some Interaction	Frequent Interaction
Governmental Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-governmental Public Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educational Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-Profit Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forestry Entities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individual Citizens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Please use the table below to provide information about the project's personnel.

	Employment Status			Field of Expertise		
	Paid/ PT	Paid/FT	Volunteer	Agriculture	Forestry	Neither
Executive Director	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program Manager	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteer Coordinator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outreach Coordinator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education Coordinator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 Please use the scale below to indicate how the project is funded.



Q13 Please list any funding sources that were considered as "other" in the question above.

Q14 Please indicate which of the following factors, if any, have provided challenges to the project's operation.

- City Ordinances
- State/Federal Law
- Public Perception/Participation
- Lack of Financial Support
- Lack of Knowledge/Expertise
- Other

Q15 Please use the space below to explain any of the challenges selected above.

Q16 Please list any other Fruit Tree Projects in the United States you are aware of and that might be interested in participating in this research.

Q17 Please use this space to provide any additional information about the project you think might be useful to this research.

Q18 If necessary, would you be interested in participating in a brief follow-up interview?

- Yes
- No